Take home exam

PhD in Business Economics                        Course: Econometrics III - Time Series

Problem 1: The data below is the index (average 2012=100) of the monthly Brazilian production meat products from January 2002 to December 2018 (\(n = 204\) observations). The data was collected from IBGE’s SIDRA system (https://sidra.ibge.gov.br/tabela/3650). Fit your best time series model to the data up to (and including) December 2017 with the goal of producing point and interval forecasts for the months of January 2018 to December 2018. In other words, your goal is to select the model that best fits out of the sample. Possible models include AR, MA, ARMA, ARIMA models and seasonal extensions of these models. Report your model search strategy and findings in details along with your R code.

Problem 2: Download data on VALE, from yahoo.finance for instance, starting around 2007 and finishing as close to today as possible. Your task is to fit the GARCH(1,1) model and its various versions presented in class as well as the standard stochastic volatility model to its log returns. If \(t_n\) is the last day of your analysis, produce variance forecasts for the following 10 days, i.e. \(t_{n+1}, \ldots, t_{n+10}\).